

SYRINGE SAFETY SLEEVE

2 BACKGROUND OF THE INVENTION

3 1. Field of the Invention

4 The present invention relates to a safety feature for a syringe, and more
5 particularly to a syringe safety sleeve that can be mounted around the barrel of a
6 syringe and keep people from being injured by the needle of the syringe.

7 2. Description of Related Art

A conventional syringe comprises a hollow barrel, a plunger and a needle hub with a needle. To keep people from being injured by a used needle, manufacturers have developed safety syringes with retractable needles. In one configuration, the contaminated needle is drawn entirely into the barrel after the syringe has been used. In another configuration, a safety sleeve is formed with the syringe when the syringe is manufactured. The conventional safety sleeve comprises an outer sleeve and an inner sleeve slidably mounted inside the outer sleeve. The inner sleeve of the conventional safety sleeve is formed with the syringe, and the outer sleeve can pull out from the inner sleeve to retain the used needle.

However, conventional syringes with retractable needles or the safety sleeve formed with the syringe are directly modified during manufacturing and are expensive to manufacture. Furthermore, modified syringes cannot be used with ordinary syringes that have no safety device to protect the used needle.

22 SUMMARY OF THE INVENTION

23 The main objective of the present invention is to provide a syringe safety
24 sleeve that is compatible with ordinary syringes with a simple structure and no

1 safety device to cover used needles of the syringes.

2 To achieve the objective, a syringe safety sleeve in accordance with the
3 present invention comprises an inner sleeve and an outer sleeve. The inner sleeve
4 slidably mounted inside the outer sleeve and securely attaches to the barrel of a
5 conventional syringe. The syringe safety sleeve can readily convert ordinary
6 syringes with no safety device to protect the used needle to a safety syringe.

7 Further benefits and advantages of the present invention will become
8 apparent after a careful reading of the detailed description with appropriate
9 reference to the accompanying drawings.

10 **BRIEF DESCRIPTION OF THE DRAWINGS**

11 Fig. 1 is an exploded perspective view of a syringe safety sleeve in
12 accordance with the present invention and a conventional syringe;

13 Fig. 2 is a perspective view of the syringe safety sleeve in Fig. 1
14 mounted on a conventional syringe;

15 Fig. 3 is a side plan view in partial section of the syringe safety sleeve
16 and conventional syringe in Fig. 2;

17 Fig. 4 is a perspective view of the syringe safety sleeve and conventional
18 syringe in Fig. 1 with the outer sleeve pulled out of the inner sleeve; and

19 Fig. 5 is a side plan view in partial section of the syringe safety sleeve
20 and conventional syringe in Fig. 4.

21 **DETAILED DESCRIPTION OF THE INVENTION**

22 With reference to Figs. 1 to 3, a syringe safety sleeve in accordance with
23 the present invention is mounted on a conventional syringe (not numbered) to
24 convert the conventional syringe to a safety syringe. The syringe comprises a

1 hollow barrel (40), a plunger (44), a needle hub (not numbered), a needle (46)
2 and a safety cover (not shown). The hollow barrel (40) has a proximal end (not
3 numbered), a distal end (not numbered) and a finger flange (42). The finger
4 flange (42) is formed integrally with and extends radially out from the proximal
5 end of the hollow barrel (40). Before the syringe is used, the safety cover (not
6 shown) covers the needle (46) and attaches to the needle hub.

7 The syringe safety sleeve comprises an outer sleeve (10) and an inner
8 sleeve (20). The outer sleeve (10) has an open proximal end (12), an open distal
9 end (16) and a locking member (not numbered). The locking member is formed
10 at the open proximal end (12) and may be implemented optionally with multiple
11 protrusions (14) or an annular rib (not shown) extended inward from the open
12 proximal end (12). The open distal end (16) may be tapered inward.

13 The inner sleeve (20) is slidably mounted inside the outer sleeve (10)
14 and has an open proximal end (24), an open distal end (22), a barrel connector
15 (30) and a locking unit (not numbered). The open proximal end (24) is tapered
16 outward and selectively connects to the open proximal end (12) of the outer
17 sleeve (10) by pulling the outer sleeve (10) out from the inner sleeve (20) until
18 the locking member engages the locking unit. The locking unit is formed at the
19 open proximal end (24) and may be implemented with an annular recess (26)
20 corresponding to the locking member.

21 The barrel connector (30) is formed on the open distal end (22) of the
22 inner sleeve (20) to connect the inner sleeve (20) to a conventional syringe and
23 has a retainer (36), a hinge (32) and a flange (34). The flange (34) has a center
24 (not numbered), a connected side (not numbered), an unconnected side (not

1 numbered), a bottom (not numbered), a central hole (31) and optional multiple
2 fastener holders (not numbered) and is formed on and protrudes radially from the
3 open distal end (22) of the inner sleeve (20). The central hole (31) is formed in
4 the center of the flange (34). The fastener holders in the flange (34) are formed
5 near the unconnected side of the flange (34) and may be multiple through holes
6 (33), slots (not shown), notches (not shown), etc.

7 The retainer (36) is selectively connected to the flange (34) and has a
8 connected side (not numbered), an unconnected side (not numbered), a notch (35)
9 and multiple fasteners (not numbered). The notch (35) is shaped to accommodate
10 free movement of the syringe plunger (44) and communicates with the
11 unconnected side of the retainer (36). The fasteners are formed on and protrude
12 from the bottom near the unconnected side, correspond respectively to the
13 fastener holders and attach to the flange (34) to attach the syringe safety sleeve to
14 the finger flange (42) of a conventional syringe. The fasteners are formed near
15 the unconnected side of the retainer (36) corresponding respectively to the
16 fastener holders in the flange (34) and may be multiple cylindrical protrusions
17 (37), hooks (not shown), tabs (not shown), etc. Where the fasteners are
18 implemented with the cylindrical protrusions (37), each cylindrical protrusion
19 (37) has an enlarged head (38). Where the fasteners are implemented with tabs,
20 the tabs may be T-shaped to fit into and be held by slots or notches in the flange
21 (34), or the tabs may be foldable to fold around the unconnected side of the
22 flange (34).

23 The hinge (32) pivotally connects the connected side of the retainer (36)
24 to the connected side of the flange (34). The hinge (32) has two sides (not

1 numbered). The sides are securely attached respectively to the connected sides of
2 the retainer (36) and the flange (34). The hinge (32) may be a mechanical hinge
3 (not shown) or a flexible tab (not numbered).

4 Before the syringe safety sleeve is mounted on a syringe, the open
5 proximal end (24) of the inner sleeve (20) is compressed and inserted through the
6 open proximal end (12) into the outer sleeve (10).

7 To mount the syringe safety sleeve on a syringe, the needle (46) with the
8 safety cover is inserted into the central hole (31) in the flange (34) of the barrel
9 connector (30). The barrel (40) of the syringe is pushed into the inner sleeve (20)
10 until the finger flange (42) abuts the flange (34) on the barrel connector (30), and
11 the barrel connector (30) is fastened around the finger flange (42) of the syringe
12 and securely holds the syringe in the inner sleeve (20). Where the fasteners on
13 the retainer (36) are cylindrical protrusions (37) with enlarged heads (38), the
14 cylindrical protrusions (37) with the enlarged heads (38) are pushed respectively
15 through the corresponding through holes (33) in the flange (34) or are slid
16 through corresponding slots in the flange (34). When the finger flange (42) of the
17 syringe is securely mounted in the connector (30) on the inner sleeve (20), the
18 needle hub of the syringe extends out of the open distal end (16) of the outer
19 sleeve (10) when the open proximal end (12) of the outer sleeve (10) abuts the
20 flange (34) on the inner sleeve (20).

21 With further reference to Figs 4 and 5, to prevent personnel from being
22 injured and infected by contaminated needles (46) during the disposal process,
23 the outer sleeve (10) is pull out from the inner sleeve (20) and locked in position
24 to cover the contaminated needle (46). The open proximal end (12) of the outer

1 sleeve (10) is locked to the open proximal end (24) of the inner sleeve (20) when
2 the locking member on the outer sleeve (10) engages the locking unit on the
3 inner sleeve (20).

4 The syringe safety sleeve for the syringe as described can accommodate
5 an ordinary syringe with no safety device to protect people from used needle.
6 The syringe safety sleeve can be conveniently connected to the syringe and has a
7 simple structure.

8 Although the invention has been explained in relation to its preferred
9 embodiment, many other possible modifications and variations can be made
10 without departing from the spirit and scope of the invention as hereinafter
11 claimed.